

Penerapan Model Pembelajaran AIR untuk Meningkatkan Kemampuan Komunikasi Matematika Siswa Sekolah Menengah Pertama

Sri Rohayati

SMP Negeri 1 Cilaku Kab. Cianjur

Email: rohayati_sri@ymail.com

Abstrak

Kemampuan komunikasi matematika siswa di SMP 1 Cilaku masih rendah karena terbatasnya model pembelajaran yang digunakan dalam proses pembelajaran matematika. Proses pembelajaran biasa didominasi oleh guru sehingga membuat siswa merasa jenuh, bosan, dan pembelajaran jadi terasa tidak menyenangkan. Tujuan penelitian ini adalah untuk meningkatkan kemampuan komunikasi siswa kelas VII SMP 1 Cilaku di Cianjur menggunakan model AIR dan dapat meningkatkan aktivitas belajar siswa, menyampaikan pendapat dalam proses menyelesaikan masalah, keterampilan bertanya dan pengetahuan. Penelitian ini merupakan penelitian tindakan kelas dengan dua siklus pada siswa kelas VII D di SMP 1 Cilaku tahun ajaran 2016-2017 sebagai objek penelitian. Terdapat pengaruh penerapan model pembelajaran AIR. Pembelajaran berjalan dengan kondusif sehingga siswa memberikan respon yang positif dan menunjukkan peningkatan pada setiap siklus.

Kata Kunci: model Pembelajaran AIR, komunikasi matematika

The Application of AIR Learning Model to Increase Junior High School Students Mathematical Communication Ability

Abstract

Mathematical communication ability among students in Cilaku 1 junior high school still low because of the lack of the learning models in mathematics lesson. The ordinary learning mostly dominated by the teacher that makes the students feel saturated, bored, and makes the lesson considered not fun. The aims of this research are to increase the students's mathematical communication ability grade VII in Cilaku 1 junior high school in Cianjur by using the AIR model and can increase the students's learning activity, the clear arguments in completion problem process, asking and knowledge skills. This research is action class research through two cycles with students in D class grade VII in Cilaku 1 junior high school year 2016-2017 as the objects of the research. Significantly had done the lesson using AIR model. The lesson is conducive so that the students give positive response and shows increase in every cycles.

Keywords : AIR learning model, mathematics communication

INTRODUCTIONS

Mathematics is universal knowledge which underlies the modern technology development, and has important role in every science discipline. That's why mathematics as the structured science that improve critical thinking, objective, and open attitude become important for the students face the science and technology knowledge.

National Council of Teachers of Mathematics (Yaniawati, 2006) formulated five general aims learning mathematics, there are mathematical communication, mathematical reasoning, mathematical problem solving, mathematical connections, and positive attitudes toward mathematics.

Silver dan Smith (1996, p.20) expressed that teachers jobs are the involvement of the students in every maths exercises, control the students intelectual activity in discussion and communication in the class, and help the students in unerstanding the idea and monitoring their understanding.

Depends on NCTM and silver ans smith view in fact the mathematics communication indeed need to be grown among the students. This matter strengthened by Barody that in learning proccess we need to help the students communicate their ideas through five communication aspects which are : representing, listening, reading, discussing and writing.

Based on the result of the research that had done in the VII grade in Cilaku 1 junior High School that in the mathematic learning there are still some problems. As for the prblems seuch as : First, the average score in VII grade in Cilaku 1 junior high school have not reach yet the KKM score. Second, mostly the learning process are using conventional learning which mostly the teacher give material and exercise. Third, the students tend to be passive, bored, and not less of the students are talking in the learning process.

The teacher should makes the class atmosphere interesting and fun, so that teacher need inovations to get the students interest so the students are excited to the materials that the teacher will give. With motivation that come from the students, it will influence to the result of the learning process.

One of the form of learning processes that can make students active and can improve their result in learning is AIR approach. This approach is one of the effective models that can influence the students learning result, respones, and the activeness in the class. AIR is the alternative models that be practiced in learning math. This model assumed the learning will be effective if we considered to three matters, auditory, intellectually and repetition. Auditory is ear sensory use in learning by listening, talking, presenting, argumentating, and suggesting opinions and responding. Intellectual is the ability of thinking which train through reasoning, making, solving problem, constructing and applying. Repetition is the repeating which need to deeper and larger understanding, the students train through exercises and quizzes.

By using this AIR approach the students trained to be active to communicate their understanding in math concept and the apply of the problem solving. After the learning students are hoped can earn the good impression that can improve their learning motivation.

Maulana stated in handayani (2014, p.3) AIR leaning models assumed the learning will be effective if we considered to three matters, audiotory, intellectually and repetion. Audiotory is ear sonseonry use in learning by listening, talking, presenting, argumentating, and suggesting opinions and responding. Intellectual is the ability of thinking which train through reasoning, making, solving problem, constructing and applying. Repetition is the repeating which need to deeper and larger understanding, the students train through exercises and quizzes.

The steps of the learning using the AIR approach: 1) The students are divide into some group, that contain 4-5 person; 2) The students listen and pay attention to the teacher; 3) Every groups discuss the material that they've learned and write the result of the dicussion to be presented next in front of the class; 4) In the discussion section, the students will get exercise or problem about the material; 5) Each gropus think how to aply the result of the

discussion that can improve their ability to fix the problems; 6) After the discussion the students repeat the materials by doing the exercises or quizzes (*repetition*).

Depends to greenes and schulman mathematical communication is the ability to: 1) Stating ideas through speech, writing, demonstration, and draw in the different visuals; 2) Understanding, interpreting, and rating the idea in speech, writing or in visual forms; 3) Constructing, interpreting and connecting each representation ideas and its connection.

NCTM stated that communication ability should covers a wide range of thinking, questioning, explaining the question and justifying ideas. Communication should be integrated well in the class. The students should be pushed to stating and writing conjecture, question and solution.

Mathematical communication ability can be explain as the student ability in deliver something which knows through dialogue event or the connection which is happening in the class, where the changing message happens. The message is about the materials that the students learn, like concepts, formulas or the fixing strategies a problem. The party that involved in this communication in the class are teacher and student. The redirects can be speech, written, concrete, graphic, or algebra by terms or math symbols.

The indicators of math communication ability symbols are: 1) Reflect real things, pictures, and diagrams to math ideas; 2) Make a situation models or subjects using speech, written, concrete, graphic and algebra; 3) State the daily events in terms or math symbols.

METHODS

This research is a classroom action research which the forms of study have the quality of reflection by the object, which aim to improve the math communication ability that done in learning process. This research done collaboratively between the teacher and the observer to see the students activity and also to see the improvement of the students math communication ability in mathematics learning using the AIR model.

In this research the observer is the mathematics teacher where the research is do. The observer observe the mathematic learning process happen in the class to revise the next learning. Quoad the plan of this classroom action research is based to the PTK theory depends to Kemmis and Mc taggart, where on cycles have four stages, which are. Planning, acting, Observing, reflecting. This research using two cycles.

This research done in Cilaku 1 junior high school in Jl. Munjul – Soreang Km 06, Cilaku districts, Cianjur district. The subject of this research are 34 students in VII-D cilaku 1 junior high school semester 1 year 2016-2017. And the materials that they learned is algebra forms and the operation of algebra arithmetic.

Instruments that use is test (end test cycle) and non-test (daily journal and observation sheet).

RESULT AND DISCUSSION

From the data before the observation showed the completeness of the students in VII-D are 42,66% under KKM with 66,1 average. The assessment of result in this learning consist of two type, learning process assessment and result learning assessment. In the learning process

in grup, generally students follow the learning truly, but, most of them have not get used to it yet to state the daily problems in symbols or mathematics terms as can be seen in table 1.

Table 1. Cycle 1 Learning Process Data Assessment

Group	Aspect 1	Aspect 2	Aspect 3	Conclusion
1	G	G	P	Good
2	G	G	D	Plenty
3	G	P	P	Plenty
4	G	P	D	Plenty
5	P	P	P	Plenty
6	P	P	P	Plenty
7	P	P	P	Plenty

Explanation :

Aspect 1 : students activity in discussion

Aspect 2 : students suggestions

Aspect 3 : learning essential quality

VG : very good

G : good

P : plenty

D : deficient

Meanwhile, the result of the learning relatively have not show the good result. From 34 students who learned, mostly got 58,24 as the average in following full recapitulation data.

Table 2. Result Learning Recapitulation Data Cycle 1

Data Type	Ind 1	Ind 2	Ind 3	Amount	Average
Amount	180	76	140	396	1980
Average	5,29	2,24	4,12	11,65	58,24
Highest Score	8	3	5	16	80,00
Lowest Score	3	1	2	7	35,00
Ideal Score	10	3	7	20	
Minimum Conditional Criteria					68

The acquisition of the average score showed that the gain of KKM in cycle 1 still on 58,24 with classical absorption 58,23% (low category) and mastery learning on 29,4 (low category). In cycle 1 only found 22 students who accomplish mastery of learning whilst 12 other students still need to learn in the next cycle.

The improvement of the result of the cycle II is very seen. The research observation and grup discussion went dynamically well, so the observation can obtained this data below :

Table 3. Data learning process assessment Cycle II

Group	Aspect 1	Aspect 2	Aspect 3	Conclusion
1	G	G	G	Good
2	G	G	G	Good
3	G	G	P	Good
4	G	G	G	Good
5	G	G	P	Good
6	G	G	G	Good
7	G	G	G	Good
8	G	G	G	Good

Explanation :

Aspect 1 : students activity in discussion

Aspect 2 : students suggestions

Aspect 3 : learning essential quality

VG : very good

G : good

P : plenty

D : deficient

By considering the effort that done by the students also the experiences of each students, gained data as below:

Table 4. Result learning recapilutation data cycle II

Data Type	Ind 1	Ind 2	Ind 3	Amount	Average
Amount	234	94	197	525	2625
Average	6,88	2,76	5,79	15,44	77,21
Highest Score	9	3	7	19	95,00
Lowest Score	4	2	5	12	60,00
Ideal Score	10	3	7		
MinimumContitional Criteria					68

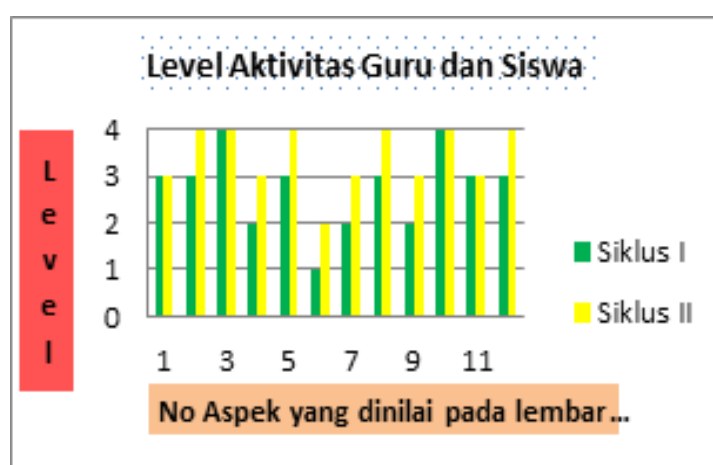
The average score acquisition in cycle II on math communication ability gained 77,21 with classical absorption 77,2%, and mastery learning 85,3%. Whilst, the highest score is 95 and the lowest is 60. Eventhough in this cycle there still one stdents who have not passed yet, classically this learning is passed. That showed by the improvement if the learning from cycle I and II.

The result of the observation showed the students activity while learning and the effectiveness of the communication observed in math class by using AIR learning model. The result of the observation sheet is use to find out the presence or the absnece the improvement of the students and teacher activity during the process of the learning. This is the result of the obervation in table 5

Table 5. Activity Level Every Cycle

Cycle	Teacher and Student Activity Level												Amount	Average
	1	2	3	4	5	6	7	8	9	10	11	12		
I	3	3	4	2	3	1	2	3	2	4	3	3	33	2,8
II	3	4	4	3	4	2	3	4	3	4	3	4	41	3,4

Based on the result of the observation on the whole cycle concluded that the result of the observation of the students and teacher on every learning process increased and categorized well. It can be seen in cycle I the first meeting showed low category < 3 then in the next learning it improved in high category > 3. It clearly seen that there are improvement, students positive responses to the mathematics learning by using AIR learning model so the table can be declared in picture 1.



Picture 1. Teacher and Students Level Activities

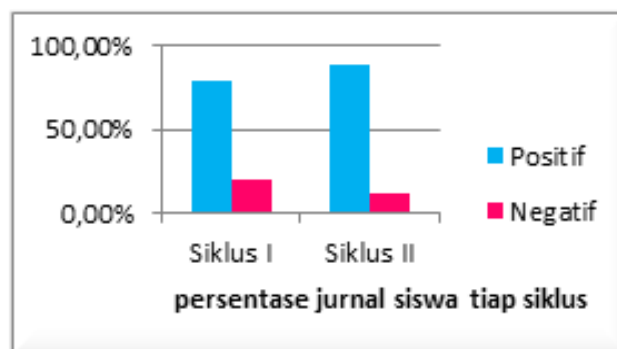
From the data above we can conclude that the mathematics learning using AIR models can be accepted well and have high category.

Students in every cycle get impression journal. The count of it divide into two categories there are positive and negative. The percentage can be seen in this table

Tabel 6. Student's Impression Journal In Every Cycles

Kategori	Frek. Jurnal Siswa Tiap Siklus		Persentase Tiap Siklus	
	I	II	I	II
Positif	27	30	79,41%	88,24%
Negatif	7	4	20,59%	11,76%

The table 6 above showed that generally the students gives positive impression to mathematic learning using AIR learning model. This can be seen from the positive response that increase in every cycles and the negative decrease in every cycle. And the result can be seen in Picture 2.



Picture 2. Presentation of Student's Journal

Depends the analysis of the data result, then the following description. For the mathematical communication ability in aljabar form and aljabar arithmetic by using the AIR learning models, students improved in every cycles. It can be seen in from the analysis of the exercise that have done and classical absorption counted and mastery learning.

Whereas for the students whose score have not got the KKM score in cycle II sustained decreased from the previous cycle. The students whose score under the KKM score possibly caused by inhibitor factors in-between students less use the activity in learning process in every learning process so that in the discussion activity still dominated by students who has high intelligence and its possible that come from another factors to the students who are lack face the cycle.

Besides the students extent of math communication ability, there an improvement also to the classical absorption which increasing in every cycle. From the reslut of analysis and the discussion it can conclude that math lessons using AIR learning model can increase student's math communication ability.

While based on the qualitative data analysis the observation and the students daily journal which use as the secondary data in this research and as the aim to know the responses from the students about the AIR learning models, and the students responses are positive. It can be seen from the student's opinion in the journal that given in every cycle mostly gave positive opinions and some of the gave negative opinions. However in every cycles the students who give positive impression increase their ability otherwise the students who give negative impression decrease their ability.

Be based to the analysis result of learning process and result that have done, it can concluded that the hypothesis formulated "*AIR learning model can increase mathematic communication ability of VII grade students in cilaku 1 junior high school*" can be accepted.

CONCLUSION

Depends on the research result dan analsis the observation data from 2 cycles of math learning by using AIR learning model as the effor to improve math communication of the students in vii-d cilaku 1 junior highschool we can conclude: 1) Mathematic learning by using AIR learning model can improve students' mathematical communication ability in each cycle. This is evidenced by the increase in the average value of the results of the test cycle I and cycle II. In addition also seen from the increasing classical absorption in each cycle; 2) The

classroom atmosphere during mathematics learning using the AIR learning model is in a conducive and pleasant environment. This can be seen from the result of activity level of student and teacher which have been observed by observer is in good category; 3) Student response in learning mathematics by using AIR learning model is positive that is marked with student journal which positive comment have improvement in every cycle.

Based on the conclusion of the research about the application of AIR learning model as the effort to increase the student math communication ability there are some suggestion that the author can say, there are: 1) Mathematical learning by using AIR learning model contributes well. For that teachers need to try and apply the AIR learning model in the learning activities of mathematics. Many advantages with the implementation of this learning model, namely: students can work together with friends of his group in working on difficult questions, students are trained to express opinions with bold and responsible to himself or his group friends; 2) Teacher follow up this research by other material and different school with the larger subject; 3) Teacher and the other observer who wants to apply AIR learning model to concern this matters: the observer should be able to manage and control the class during the learning process particularly in groups work. Aside from that it is hope that the teacher can do the reflection so the shortcoming can be fix to fulfill the aim of the learning itself.

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